Lesson Plan of FUNDAMENTALS OF ELECTRICAL ENGINEERING

3rd Sem Electrical Engineering

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| W W | Period | Theory Portion | W W | Practical |
| I | 1 | Introduction: Application and Advantages of Electrical Energy | I,II | Determination of voltage current relationship in a dc circuit under specific  physical conditions and to draw conclusions (to verify ohm’s law) |
|  | 2 | Different forms of energy | III, IV | Filament lamp:  Measure the resistance of a cold lamp filament with the help of calculations, Measure the current drawn by the lamp at different voltages from zero to 220 volts and the resistance of lamp at different voltages, plot a graph between current and voltage |
|  | 3 | Advantages of electrical energy | V,VI | To verify that Rt R1+R2+….Rn where R1, R2 Rn etc. are resistances connected in series, To verify  1 1 1 1  -- = -- + -- + - - - - - - + --  RtR1 R2 Rm  Where R1, R2 etc. are resistances connected in parallel |
|  | 4 | Uses of electrical energy | VII,VIII | Verification of Kirchhoff’s current and voltage laws applied to DC circuits: to construct a circuit arrangement consisting of resistances in series,  parallel combination, identification of node points in the circuit, identification of node points in the circuit, to see that algebraic sum of currents at node point is zero, to see that algebraic sum of emfs and voltage drops in a closed loop is zero |
| II | 1 | Basic Electrical Quantities: Basic concept of charge, current, voltage, resistance, power, energy and their units | IX,X | To find ratio of inductance values of a coil having air /iron core respectively and to see the effect of introduction of a magnetic core on coil inductance |
|  | 2 | Basic Electrical Quantities: Basic concept of charge, current, voltage, resistance, power, energy and their units | XI,XII | To construct an RL and RC circuit and to measure: their impedance, phase angle between voltage and current,construct impedance triangle |
|  | 3 | Basic Electrical Quantities: Conversion of units of work, power and energy from one form to another | XIII,XVI | Measurement of power and power factor of a single phase RLC circuit. To calculate kVA and kVAR |
|  | 4 | Basic Electrical Quantities: Conversion of units of work, power and energy from one form to another | XV | Testing a battery for its charged condition and to charge it |
| III | 1 | DC Circuits: Ohm’s law, resistances in series and parallel |  |  |
|  | 2 | Kirchhoff’s laws and their applications in solving electrical network problems |  |  |
|  | 3 | Kirchhoff’s laws and their applications in solving electrical network problems |  |  |
|  | 4 | Network theorems such as Thevenin’s theorem, superposition theorem Maximum power transfer theorem and Norton’s theorem |  |  |
| IV | 1 | Network theorems such as Thevenin’s theorem, superposition theorem Maximum power transfer theorem and Norton’s theorem |  |  |
|  | 2 | Star-delta transformation |  |  |
|  | 3 | Batteries : Basic idea about primary and secondary cells |  |  |
|  | 4 | Batteries : Basic idea about primary and secondary cells |  |  |
| V | 1 | Working principle, construction and applications of Lead acid, Nickel Cadmium and Silver Oxide Cells |  |  |
|  | 2 | Working principle, construction and applications of Lead acid, Nickel Cadmium and Silver Oxide Cells |  |  |
|  | 3 | Working principle, construction and applications of Lead acid, Nickel Cadmium and Silver Oxide Cells |  |  |
|  | 4 | Charging methods used for lead acid accumulator |  |  |
| VI | 1 | Charging methods used for lead acid accumulator |  |  |
|  | 2 | Care and maintenance of a lead acid battery |  |  |
|  | 3 | Care and maintenance of a lead acid battery |  |  |
|  | 4 | Grouping of cells in series and parallel (simple numerical problems) |  |  |
| VII | 1 | Grouping of cells in series and parallel (simple numerical problems) |  |  |
|  | 2 | Magnetism and Electromagnetism: Introduction to electromagnetism, Magnetic field around a straight current carrying conductor and a solenoid |  |  |
|  | 3 | Magnetism and Electromagnetism: Introduction to electromagnetism, Magnetic field around a straight current carrying conductor and a solenoid |  |  |
|  | 4 | Methods to find its direction, force between two parallel current carrying conductors. |  |  |
| VIII | 1 | Methods to find its direction, force between two parallel current carrying conductors |  |  |
|  | 2 | Force on a conductor placed in the magnetic field |  |  |
|  | 3 | Force on a conductor placed in the magnetic field |  |  |
|  | 4 | Series magnetic circuits, simple problems |  |  |
| IX | 1 | Series magnetic circuits, simple problems |  |  |
|  | 2 | Concept of hysteresis, loop and hysteresis loss |  |  |
|  | 3 | Concept of hysteresis, loop and hysteresis loss |  |  |
|  | 4 | Electromagnetic Induction: Faraday's Laws of electromagnetic induction |  |  |
| X | 1 | Electromagnetic Induction: Faraday's Laws of electromagnetic induction |  |  |
|  | 2 | Electromagnetic Induction: Lenz's law |  |  |
|  | 3 | Electromagnetic Induction: Fleming's Right and Left Hand Rule |  |  |
|  | 4 | Electromagnetic Induction: Principle of self and mutual induction |  |  |
| XI | 1 | Electromagnetic Induction: Principle of self and mutually induced e.m.f. and simple problems |  |  |
|  | 2 | Electromagnetic Induction: Inductances in series and parallel |  |  |
|  | 3 | Electromagnetic Induction: Energy stored in a magnetic field |  |  |
|  | 4 | Electromagnetic Induction: Concept of eddy currents, eddy current loss |  |  |
| XII | 1 | AC Fundamentals: Concept of A.C. generation (single phase and three phase) |  |  |
|  | 2 | Difference between A.C and D.C |  |  |
|  | 3 | Concept of alternating current and voltage, equation of instantaneous values, average value, r.m.s value, form factor, power factor etc. |  |  |
|  | 4 | Concept of phase and phase difference |  |  |
| XIII | 1 | Representation of alternating sinusoidal quantities by vectors |  |  |
|  | 2 | Phasor algebra (addition, subtraction, multiplication and division of complex quantities) |  |  |
|  | 3 | AC Circuits: AC through pure resistance, inductance and capacitance |  |  |
|  | 4 | Alternating voltage applied to RL,RC and RLC series and parallel circuits (impedance triangle, phasor diagram and their solutions) |  |  |
| XIV | 1 | Introduction to susceptance, conductance and admittance |  |  |
|  | 2 | Power in pure resistance, inductance, capacitance, RL, RC, RLC circuits |  |  |
|  | 3 | Active and reactive components of current and their significance |  |  |
|  | 4 | Power factor and its practical significance |  |  |
| XV | 1 | Poly-Phase Systems: Advantages of 3Ø over 1- Ø system |  |  |
|  | 2 | Star & delta connections (derive relationship b/w phase Voltage(Vph) Line Voltage (VL ) and Phase Currrent (Iph) Line Current (I L) in star delta connections |  |  |
|  | 3 | 3-phase balanced and unbalanced circuits |  |  |
|  | 4 | Power in 3-phase circuits |  |  |

Lesson Plan of COMPUTER APPLICATIONS IN ELECTRICAL INSTALLATIONS

3rd Sem Electrical Engineering

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| W W | Period | Practical |
| I | 1,2,3 | MATLAB and SCILAB: Introduction to MATLAB, MATLAB Programming – input/output, types of graphs, functions, loops, structures, MATLAB Simulink. |
| II | 1,2,3 | MATLAB and SCILAB: Introduction to MATLAB, MATLAB Programming – input/output, types of graphs, functions, loops, structures, MATLAB Simulink |
| III | 1,2,3 | MATLAB and SCILAB: Introduction to MATLAB, MATLAB Programming – input/output, types of graphs, functions, loops, structures, MATLAB Simulink |
| IV | 1,2,3 | MATLAB and SCILAB: Introduction to MATLAB, MATLAB Programming – input/output, types of graphs, functions, loops, structures, MATLAB Simulink |
| V | 1,2,3 | MATLAB and SCILAB: Introduction to MATLAB, MATLAB Programming – input/output, types of graphs, functions, loops, structures, MATLAB Simulink |
| VI | 1,2,3 | LABVIEW: Graphical Programming using LabVIEW including creation of VIs, subVIs, structures, arrays, clusters, charts and graphs, strings, File I/Os. Practice on NI ELVIS and other DAQ hardware |
| VII | 1,2,3 | LABVIEW: Graphical Programming using LabVIEW including creation of VIs, subVIs, structures, arrays, clusters, charts and graphs, strings, File I/Os. Practice on NI ELVIS and other DAQ hardware |
| VIII | 1,2,3 | LABVIEW: Graphical Programming using LabVIEW including creation of VIs, subVIs, structures, arrays, clusters, charts and graphs, strings, File I/Os. Practice on NI ELVIS and other DAQ hardware |
| IX | 1,2,3 | LABVIEW: Graphical Programming using LabVIEW including creation of VIs, subVIs, structures, arrays, clusters, charts and graphs, strings, File I/Os. Practice on NI ELVIS and other DAQ hardware |
| X | 1,2,3 | LABVIEW: Graphical Programming using LabVIEW including creation of VIs, subVIs, structures, arrays, clusters, charts and graphs, strings, File I/Os. Practice on NI ELVIS and other DAQ hardware |
| XI | 1,2,3 | EPAN: Utility of EPLAN software |
| XII | 1,2,3 | EPAN: Utility of EPLAN software |
| XIII | 1,2,3 | EPAN: Utility of EPLAN software |
| XIV | 1,2,3 | EPAN: Utility of EPLAN software |
| XV | 1,2,3 | EPAN: Utility of EPLAN software |

Lesson Plan of ELECTRICAL AND ELECTRONICS ENGINEERING MATERIALS

3rd Sem Electrical Engineering

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| --- | --- | --- |
| W W | Period | Theory Portion |
| I | 1 | Classification: Classification of materials into conducting, semi conducting and insulating materials through a brief reference to their atomic structure and energy bands |
|  | 2 | Classification: Classification of materials into conducting, semi conducting and insulating materials through a brief reference to their atomic structure and energy bands |
|  | 3 | Conducting Materials: Introduction |
|  | 4 | Conducting Materials: Resistance and factors affecting it such as alloying and temperature etc |
| II | 1 | Classification of conducting material as low resistivity and high resistivity materials, low resistance materials |
|  | 2 | Copper: General properties as conductor: Resistivity, temperature coefficient, density, mechanical properties of hard-drawn and annealed copper, corrosion, contact resistance. Application in the field of electrical engineering. |
|  | 3 | Aluminium:General properties as conductor: resistivity, temperature coefficient, density, mechanical properties of hard and annealed aluminium, solderability, contact resistance. Applications in the field of electrical engineering |
|  | 4 | Steel:Mechanical properties of steel, applications in the field of electrical engineering |
| III | 1 | Introduction to bundle conductors and its applications. |
|  | 2 | Low resistivity copper alloys: Brass, Bronze (cadmium and Beryllium), their practical applications with reasons for the same |
|  | 3 | Applications of special metals e.g. Silver, Gold, Platinum etc. |
|  | 4 | High resistivity materials and their applications e.g., manganin, constantan, Nichrome, mercury, platinum, carbon and tungsten |
| IV | 1 | Superconductors and their applications |
|  | 2 | Review of Semi-conducting Materials:Semi-conductors and their properties, Materials used for electronic components like resistors, capacitors, diodes, transistors and inductors etc. |
|  | 3 | Review of Semi-conducting Materials:Semi-conductors and their properties, Materials used for electronic components like resistors, capacitors, diodes, transistors and inductors etc. |
|  | 4 | Insulating materials; General Properties:  Electrical Properties:Volume resistivity, surface resistance, dielectric loss, dielectric strength (breakdown voltage) dielectric constant |
| V | 1 | Insulating materials; General Properties:  Electrical Properties:Volume resistivity, surface resistance, dielectric loss, dielectric strength (breakdown voltage) dielectric constant |
|  | 2 | Physical Properties:  Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness |
|  | 3 | Physical Properties:  Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness |
|  | 4 | Thermal Properties:  Heat resistance, classification according to permissible temperature rise. Effect of overloading on the life of an electrical appliance, increase in rating with the use of insulating materials having higher thermal stability, Thermal conductivity, Electro-thermal breakdown in solid dielectrics |
| VI | 1 | Thermal Properties:  Heat resistance, classification according to permissible temperature rise. Effect of overloading on the life of an electrical appliance, increase in rating with the use of insulating materials having higher thermal stability, Thermal conductivity, Electro-thermal breakdown in solid dielectrics |
|  | 2 | Chemical Properties: Solubility, chemical resistance, weatherability |
|  | 3 | Chemical Properties: Solubility, chemical resistance, weatherability |
|  | 4 | Mechanical properties, mechanical structure, tensile structure |
| VII | 1 | Mechanical properties, mechanical structure, tensile structure |
|  | 2 | Insulating Materials and their applications:  Plastics: Definition and classification |
|  | 3 | Thermosetting materials:  Phenol-formaldehyde resins (i.e. Bakelite) amino resins (urea formaldehyde and Melamine-formaldehyde), epoxy resins - their important properties and applications |
|  | 4 | Thermo-plastic materials:  Polyvinyl chloride (PVC), polyethelene, silicones, their important properties and applications |
| VIII | 1 | Natural insulating materials, properties and their applications: Mica and Mica products |
|  | 2 | Natural insulating materials, properties and their applications: Asbestos and asbestos products |
|  | 3 | Natural insulating materials, properties and their applications: Ceramic materials (porcelain and steatite) |
|  | 4 | Natural insulating materials, properties and their applications: Glass and glass products |
| IX | 1 | Natural insulating materials, properties and their applications: Cotton |
|  | 2 | Natural insulating materials, properties and their applications: Silk |
|  | 3 | Natural insulating materials, properties and their applications: Jute |
|  | 4 | Natural insulating materials, properties and their applications: Paper (dry and impregnated) |
| X | 1 | Natural insulating materials, properties and their applications: Rubber, Bitumen |
|  | 2 | Natural insulating materials, properties and their applications: Mineral and insulating oil for transformers switchgear capacitors, high voltage insulated cables, insulating varnishes for coating and impregnation |
|  | 3 | Natural insulating materials, properties and their applications: Enamels for winding wires |
|  | 4 | Natural insulating materials, properties and their applications: Glass fibre sleeves |
| XI | 1 | Gaseous materials; Air, Hydrogen, Nitrogen, SFtheir properties and applications |
|  | 2 | Magnetic Materials: Introduction - ferromagnetic materials, permeability, B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism, concept of eddy current and hysteresis loss, Curie temperature, magnetostriction effect. |
|  | 3 | Magnetic Materials: Introduction - ferromagnetic materials, permeability, B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism, concept of eddy current and hysteresis loss, Curie temperature, magnetostriction effect. |
|  | 4 | Soft Magnetic Materials: Alloyed steels with silicon: High silicon, alloy steel for transformers, low silicon alloy steel for electric rotating machines |
| XII | 1 | Soft Magnetic Materials: Alloyed steels with silicon: High silicon, alloy steel for transformers, low silicon alloy steel for electric rotating machines |
|  | 2 | Soft Magnetic Materials: Alloyed steels with silicon: High silicon, alloy steel for transformers, low silicon alloy steel for electric rotating machines |
|  | 3 | Soft Magnetic Materials: Nickel-iron alloys |
|  | 4 | Soft Magnetic Materials: Nickel-iron alloys |
| XIII | 1 | Soft Magnetic Materials: Soft Ferrites |
|  | 2 | Soft Magnetic Materials: Soft Ferrites |
|  | 3 | Soft Magnetic Materials: Hard magnetic materialsTungsten steel, chrome steel, hard ferrites and cobalt steel, their applications |
|  | 4 | Soft Magnetic Materials: Hard magnetic materialsTungsten steel, chrome steel, hard ferrites and cobalt steel, their applications |
| XIV | 1 | Special Materials: Thermocouple, bimetals, leads soldering and fuses material and their applications |
|  | 2 | Special Materials: Thermocouple, bimetals, leads soldering and fuses material and their applications |
|  | 3 | Special Materials: Thermocouple, bimetals, leads soldering and fuses material and their applications |
|  | 4 | Special Materials: Thermocouple, bimetals, leads soldering and fuses material and their applications |
| XV | 1 | Introduction of various engineering materials necessary for fabrication of electrical machines such as motors |
|  | 2 | Introduction of various engineering materials necessary for fabrication of electrical machines such as motors |
|  | 3 | Introduction of various engineering materials necessary for fabrication of electrical machines such as motors |
|  | 4 | Introduction of various engineering materials necessary for fabrication of electrical machines such as motors |

Lesson Plan of ELECTRONICS - II

3rd Sem Electrical Engineering

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| W W | Period | Theory Portion | W W | Practical |
| I | 1 | Transistor Audio Power Amplifier: Difference between voltage and power amplifier | I | To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a two stage RC coupled amplifier |
|  | 2 | Important terms in Power Amplifier, collector efficiency, distortion and dissipation capability | II,III | To measure (a) optimum load (b) output power (c) signal handling capacity of a push-pull amplifier |
|  | 3 | Classification of power amplifier class A, B and C | IV,V | To measure (a) voltage gain  (b) input and output impedance for an emitter follower circuit  To measure frequency generation in (a) Hartley  (b) R-C Phase Shift oscillator |
| II | 1 | Class A single-ended power amplifier, its working and collector efficiency | VI,VII | To observe the differentiated and integrated square wave on a CRO for different values of R-C time constant |
|  | 2 | Impedance matching in a power amplifier using transformer | VIII | Clipping of both portion of sine-wave using:   * 1. diode and dc source   2. /\*zener diodes |
|  | 3 | Heat sinks in power amplifiers |  | Clamping a sine-wave to:   * 1. a) Negative dc voltage   b) Positive dc voltage |
| III | 1 | Push-pull amplifier: circuit details, working and advantages (no mathematical derivations) | IX,X | To generate square-wave using an astable multivibrator and to observe the wave form on a CRO and verify the result using p-spice software |
|  | 2 | Principles of the working of complementary symmetry push-pull amplifier | XI,XII | To observe triggering and working of a bistable multivibrator circuit and observe its output wave form on a CRO |
|  | 3 | Tuned Voltage Amplifier: Introduction | XIII,XIV | To use the op-Amp (IC 741) as inverting one and non-inverting amplifiers, adder, comparator, integrator and differentiator and verify the result using p-spice software |
| IV | 1 | Series and parallel resonance ( No mathematical derivation) | XV | To study the pin configuration and working of IC 555 and its use as monostable and astable multivibrator |
|  | 2 | Single and double tuned voltage amplifiers |  |  |
|  | 3 | Frequency response of tuned voltage amplifiers |  |  |
| V | 1 | Applications of tuned voltage amplifiers |  |  |
|  | 2 | Feedback in Amplifiers:  Feedback and its importance, positive and negative feedback and their need |  |  |
|  | 3 | Voltage gain of an amplifier with negative feedback  A  A   * 1. A = A ----------   1+βA |  |  |
| VI | 1 | Effect of negative feedback on voltage gain, stability, distortion, band width, output   and input impedance of an amplifier (No mathematical derivation) |  |  |
|  | 2 | Typical feedback circuits |  |  |
|  | 3 | Effect of removing the emitter by-pass capacitor on a CE transistor amplifier |  |  |
| VII | 1 | Emitter follower and its applications |  |  |
|  | 2 | Sinusoidal Oscillators: Sinusoidal Oscillators – positive feedback in amplifiers |  |  |
|  | 3 | Difference between an oscillator and an alternator |  |  |
| VIII | 1 | Essentials of an oscillator |  |  |
|  | 2 | Circuit details and working of LC oscillators viz. Tuned Collector, Hartley and Colpitt’s oscillators |  |  |
|  | 3 | R-C oscillator circuits, phase shift and Wein bridge oscillator circuits |  |  |
| IX | 1 | Introduction to piezoelectric crystal and crystal oscillator circuit |  |  |
|  | 2 | Wave-Shaping and Switching Circuits: Concept of Wave-shaping |  |  |
|  | 3 | Wave-shaping circuits: R-C differentiating and integrating circuits |  |  |
| X | 1 | Wave-shaping circuits: Diode clipping circuits |  |  |
|  | 2 | Wave-shaping circuits: Diode clamping circuits |  |  |
|  | 3 | Wave-shaping circuits: Applications of wave-shaping circuits |  |  |
| XI | 1 | Wave-shaping circuits: Applications of wave-shaping circuits |  |  |
|  | 2 | Collector coupled astable, monostable, bistable multivibrator circuits(explanation using wave shapes). Brief mention of uses of multivibrators |  |  |
|  | 3 | Collector coupled astable, monostable, bistable multivibrator circuits(explanation using wave shapes). Brief mention of uses of multivibrators |  |  |
| XII | 1 | Working and applications of transistor inverter circuit using power transistors |  |  |
|  | 2 | Working and applications of transistor inverter circuit using power transistors |  |  |
|  | 3 | Power supplies: Working Principles of different types of power supplies viz. CVTs, IC voltage regulator (78 XX,79XX) |  |  |
| XIII | 1 | Power supplies: Working Principles of different types of power supplies viz. CVTs, IC voltage regulator (78 XX,79XX) |  |  |
|  | 2 | Power supplies: Working Principles of different types of power supplies viz. CVTs, IC voltage regulator (78 XX,79XX) |  |  |
|  | 3 | Power supplies: Working Principles of different types of power supplies viz. CVTs, IC voltage regulator (78 XX,79XX) |  |  |
| XIV | 1 | Operational Amplifier: The basic operational amplifier. The differential amplifier. The emitter coupled differential amplifier. Offset even voltages and currents |  |  |
|  | 2 | Operational Amplifier: The basic operational amplifier. The differential amplifier. The emitter coupled differential amplifier. Offset even voltages and currents |  |  |
|  | 3 | Basic operational amplifier applications, integrator and differentiator, summer, subtractor |  |  |
| XV | 1 | Basic operational amplifier applications, integrator and differentiator, summer, subtractor |  |  |
|  | 2 | Familiarization with specifications and pin configuration of IC 741 |  |  |
|  | 3 | Block diagram and operation of 555 IC timer |  |  |

Lesson Plan of ELECTRICAL ENGINEERING DESIGN AND DRAWING I

3rd Sem Electrical Engineering

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| --- | --- | --- |
| W W | Period | Practical |
| I | 1,2,3 | Symbols and Signs Conventions: Various Electrical Symbols used in Domestic and Industrial Installation and Power System (Generation, Transmission and Distribution including Sub-stations) as per BIS Code |
| II | 1,2,3 | Symbols and Signs Conventions: Various Electrical Symbols used in Domestic and Industrial Installation and Power System (Generation, Transmission and Distribution including Sub-stations) as per BIS Code |
| III | 1,2,3 | Wiring Diagram: Wiring diagram of light, fan, bell and alarm circuits, Staircase and godown wiring |
| IV | 1,2,3 | Wiring Diagram: Wiring diagram of light, fan, bell and alarm circuits, Staircase and godown wiring |
| V | 1,2,3 | Panels/Distribution Boards: Design and Drawing of panels/Distribution board using MCB, ELCB main switches and change over switches for domestic installation, industrial and commercial installation |
| VI | 1,2,3 | Panels/Distribution Boards: Design and Drawing of panels/Distribution board using MCB, ELCB main switches and change over switches for domestic installation, industrial and commercial installation |
| VII | 1,2,3 | Orthographic projections of Simple Electrical Parts: Bus bar post/ Kit Kat, Pin type and shackle type insulator (Pin Type 11kV/66kV) |
| VIII | 1,2,3 | Orthographic projections of Simple Electrical Parts: Bobbins of a small transformer / choke |
| IX | 1,2,3 | Orthographic projections of Simple Electrical Parts: Stay insulators/Suspension type insulators |
| X | 1,2,3 | Orthographic projections of Simple Electrical Parts: Rotor of a squirrel cage induction motor |
| XI | 1,2,3 | Orthographic projections of Simple Electrical Parts: Motor body (induction motor) as per IS Specifications (using outside dimensions) |
| XII | 1,2,3 | Orthographic projections of Simple Electrical Parts: Slip rings of 3-phase induction Motor. |
| XIII | 1,2,3 | Orthographic projections of Simple Electrical Parts: Stator of 3 phase Induction motor (Sectional View) |
| XIV | 1,2,3 | Prepare wiring diagram and block diagrams for circuits/systems using any Engineering Graphic package (preferably CAD) |
| XV | 1,2,3 | Prepare wiring diagram and block diagrams for circuits/systems using any Engineering Graphic package (preferably CAD) |

Lesson Plan of ELECTRICAL WORKSHOP PRACTICE - I

3rd Sem Electrical Engineering

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| --- | --- | --- |
| W W | Period | Practical |
| I | 1,2,3 | Study of electrical safety measures as mentioned in the Indian Electricit Rules and shock treatment including first aid |
| II | 1,2,3 | Wire jointing: Straight married joint, Joint, Western union joint, Britania joint, Twist sleeve joint, Bolted type joint |
| III | 1,2,3 | Types of wiring and to make different light control circuits in the following types of wiring: Casing and capping (PVC) wiring,Conduit wiring (surface/concealed), Filling and crimping of thimbles |
| IV | 1,2,3 | Wiring of main distribution board with four outgoing circuits for ligh and fan loads including main switch and fuses (only internal connection) Types of wiring and to make different light control circuits in the following types of wiring: Casing and Capping (PVC) wiring, Conduit wiring (surface/concealed) |
| V | 1,2,3 | Wiring of main distribution board with four outgoing circuits for ligh and fan loads including main switch and fuses (only internal connection) Types of wiring and to make different light control circuits in the following types of wiring: Casing and Capping (PVC) wiring, Conduit wiring (surface/concealed) |
| VI | 1,2,3 | Construction/assembly of Distribution Board and Extension Board:  Construction of an extension board with two 5A sockets and one I5A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision, Assembly of distribution board panel using MCB, main switch, change over switch and ELCB/RCCB,Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection) |
| VII | 1,2,3 | Construction/assembly of Distribution Board and Extension Board:  Construction of an extension board with two 5A sockets and one I5A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision, Assembly of distribution board panel using MCB, main switch, change over switch and ELCB/RCCB,Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection) |
| VIII | 1,2,3 | Simple light and Alarm Circuits (any four):  One lamp controlled by two switches (staircase circuit), Two lamps controlled by three switches (double staircase circuit), Two ordinary bells (for day and night) used at a distant residence, Bell response circuit using one bell and one relay, Bell response circuit of an office (for three rooms), Traffic light control system for two roads crossing, Wiring of a switch board containing at least two switches, one fan regulator and one 5/15A socket controlled by their respective switches using piano type switches and matching socket |
| IX | 1,2,3 | Simple light and Alarm Circuits (any four):  One lamp controlled by two switches (staircase circuit), Two lamps controlled by three switches (double staircase circuit), Two ordinary bells (for day and night) used at a distant residence, Bell response circuit using one bell and one relay, Bell response circuit of an office (for three rooms), Traffic light control system for two roads crossing, Wiring of a switch board containing at least two switches, one fan regulator and one 5/15A socket controlled by their respective switches using piano type switches and matching socket |
| X | 1,2,3 | Wiring of a series test lamp board and to use it for finding out simple faults |
| XI | 1,2,3 | Testing of domestic wiring installation using meggar |
| XII | 1,2,3 | Fault finding and repair of a tube light circuit |
| XIII | 1,2,3 | Wiring and testing of alarm and indicating circuits using relay, push buttons and bells (simple single phase circuits) |
| XIV | 1,2,3 | Wiring and testing of alarm and indicating circuits using relay, push buttons and bells (simple single phase circuits) |
| XV | 1,2,3 | Assembly of distribution board/ panel using MCB, main switch, changeover switch and ELCB etc. |

Lesson Plan of ELECTRONICS - II

3rd Sem Electrical Engineering

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| --- | --- | --- | --- | --- |
| W W | Period | Theory Portion | W W | Practical |
| I | 1 | Introduction : Purpose of estimating and costing, proforma for making estimates, preparation of materials schedule, costing, price list, preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electrical point method and fixed percentage method, contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills. | I,II,III | Framing of Tender and reply to tender to get job/project |
|  | 2 | Introduction : Purpose of estimating and costing, proforma for making estimates, preparation of materials schedule, costing, price list, preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electrical point method and fixed percentage method, contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills. | IV,V,VI | Identification of wiring for different applications |
|  | 3 | Introduction : Purpose of estimating and costing, proforma for making estimates, preparation of materials schedule, costing, price list, preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electrical point method and fixed percentage method, contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills. | VII,VIII,IX | Prepare an estimate for a Two room residential building as per given plan |
| II | 1 | Introduction : Purpose of estimating and costing, proforma for making estimates, preparation of materials schedule, costing, price list, preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electrical point method and fixed percentage method, contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills. | X,XI,XII | Prepare an estimate for service connection for residential building having connected load ---- kW |
|  | 2 | Types of Wiring: Cleat, batten, casing capping and conduit wiring, comparison of different wiring systems, selection and design of wiring schemes for particular situation (domestic and Industrial). Selection of wires and cables, wiring accessories and use of protective devices i.e. MCB, ELCB etc. Use of wire-gauge and tables (to be prepared/arranged) | XIII,XIV,XV | Visit a nearby substation and list the components with diagram |
|  | 3 | Types of Wiring: Cleat, batten, casing capping and conduit wiring, comparison of different wiring systems, selection and design of wiring schemes for particular situation (domestic and Industrial). Selection of wires and cables, wiring accessories and use of protective devices i.e. MCB, ELCB etc. Use of wire-gauge and tables (to be prepared/arranged) |  |  |
| III | 1 | Types of Wiring: Cleat, batten, casing capping and conduit wiring, comparison of different wiring systems, selection and design of wiring schemes for particular situation (domestic and Industrial). Selection of wires and cables, wiring accessories and use of protective devices i.e. MCB, ELCB etc. Use of wire-gauge and tables (to be prepared/arranged) |  |  |
|  | 2 | Types of Wiring: Cleat, batten, casing capping and conduit wiring, comparison of different wiring systems, selection and design of wiring schemes for particular situation (domestic and Industrial). Selection of wires and cables, wiring accessories and use of protective devices i.e. MCB, ELCB etc. Use of wire-gauge and tables (to be prepared/arranged) |  |  |
|  | 3 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
| IV | 1 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
|  | 2 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
|  | 3 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
| V | 1 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
|  | 2 | Estimating and Costing: Domestic installations; standard practice as per IS and IE rules. Planning of circuits, sub-circuits and position of different accessories, electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate (single storey and multi-storey buildings having similar electrical load) |  |  |
|  | 3 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
| VI | 1 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
|  | 2 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
|  | 3 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
| VII | 1 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
|  | 2 | Estimating and Costing: Industrial installations; relevant IE rules and IS standard practices, planning, designing and estimation of installation for single phase motors of different ratings, electrical circuit diagram, starters, preparation of list of materials, estimating and costing exercises on workshop with singe-phase, 3-phase motor load and the light load (3-phase supply system) |  |  |
|  | 3 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
| VIII | 1 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
|  | 2 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
|  | 3 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
| IX | 1 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
|  | 2 | Estimating and Costing: Service line connections estimate for domestic and industrial loads (over-head and underground connections) from pole to energy meter. |  |  |
|  | 3 | Estimating Materials Required: Transmission and distribution lines (overhead and underground) planning and designing of lines with different fixtures, earthing etc. based on unit cost calculations |  |  |
| X | 1 | Estimating Materials Required: Transmission and distribution lines (overhead and underground) planning and designing of lines with different fixtures, earthing etc. based on unit cost calculations |  |  |
|  | 2 | Estimating Materials Required: Transmission and distribution lines (overhead and underground) planning and designing of lines with different fixtures, earthing etc. based on unit cost calculations |  |  |
|  | 3 | Estimating Materials Required: Transmission and distribution lines (overhead and underground) planning and designing of lines with different fixtures, earthing etc. based on unit cost calculations |  |  |
| XI | 1 | Estimating Materials Required:  Substation: Types of substations, substation schemes and components,estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating, earthing of substations, Key Diagram of 66 kV/11 kV Substation. |  |  |
|  | 2 | Estimating Materials Required:  Substation: Types of substations, substation schemes and components,estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating, earthing of substations, Key Diagram of 66 kV/11 kV Substation. |  |  |
|  | 3 | Estimating Materials Required:  Substation: Types of substations, substation schemes and components,estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating, earthing of substations, Key Diagram of 66 kV/11 kV Substation. |  |  |
| XII | 1 | Estimating Materials Required:  Substation: Types of substations, substation schemes and components,estimate of 11/0.4 kV pole mounted substation up to 200 kVA rating, earthing of substations, Key Diagram of 66 kV/11 kV Substation. |  |  |
|  | 2 | Estimating Materials Required: Single line diagram, layout sketching of outdoor, indoor 11kV sub-station or 33kV sub-station |  |  |
|  | 3 | Estimating Materials Required: Single line diagram, layout sketching of outdoor, indoor 11kV sub-station or 33kV sub-station |  |  |
| XIII | 1 | Estimating Materials Required: Single line diagram, layout sketching of outdoor, indoor 11kV sub-station or 33kV sub-station |  |  |
|  | 2 | Estimating Materials Required: Single line diagram, layout sketching of outdoor, indoor 11kV sub-station or 33kV sub-station |  |  |
|  | 3 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
| XIV | 1 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
|  | 2 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
|  | 3 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
| XV | 1 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
|  | 2 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |
|  | 3 | Preparation of Tender Documents: At least 2-3 exercises, tender – constituents finalization, specimen tender |  |  |